

Applicant: Dieter JUNGER et al
Docket No. R.306813
Preliminary Amdt.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-18. **(Canceled)**

19. **(New)** A fuel injection valve for internal combustion engines, the injection valve having an outer valve needle which by means of a longitudinal motion cooperates with a valve seat for opening and closing at least one outer injection opening an inner valve needle disposed in the outer valve needle and which by means of its longitudinal motion cooperates with a valve seat for opening and closing at least one inner injection opening a control chamber which can be filled with fuel under pressure, the fuel pressure acting on the outer valve needle and the inner valve needle in such a way that as a result, a closing force in the direction of the valve seat is exerted on the inner valve needle and the outer valve needle and an inflow chamber which at least partly surrounds the outer valve needle and can be filled with fuel under pressure, the improvement wherein an opening force oriented counter to the closing force is applied to both the inner valve needle and the outer valve needle by means of the fuel pressure in the inflow chamber.

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20. **(New)** The fuel injection valve as defined by claim 19, further comprising an intermediate chamber between the outer valve needle and the inner valve needle which intermediate chamber is always in hydraulic communication with the inflow chamber.
21. **(New)** The fuel injection valve as defined by claim 20, further comprising an inner pressure face embodied on the inner needle, which inner pressure face is subjected to the pressure in the intermediate chamber.
22. **(New)** The fuel injection valve as defined by claim 20, further comprising at least one connecting bore in the outer valve needle establishing communication of the intermediate chamber with the inflow chamber.
23. **(New)** The fuel injection valve as defined by claim 21, further comprising a shoulder on the inside of the outer valve needle, which shoulder is located opposite the inner pressure face of the inner valve needle, and which is axially spaced apart from the inner pressure face upon contact of the inner valve needle and the outer valve needle with the valve seat.
24. **(New)** The fuel injection valve as defined by claim 23, wherein the inner valve needle, after lifting from the valve seat and after executing an opening stroke, comes with its face end into contact with a fixed stop, and wherein the outer valve needle after executing an opening stroke comes with its face end into contact with a fixed stop, and wherein the opening strokes are dimensioned relative to one another such that the shoulder of the outer valve needle

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remains spaced apart from the inner pressure face when the outer valve needle and the inner valve needle are in their opening position.

25. (New) The fuel injection valve as defined by claim 23, wherein the inner valve needle, after lifting from the valve seat and after executing an opening stroke, moves into an opening position and with its face end comes into contact with a fixed stop, and wherein the shoulder of the outer valve needle in its opening stroke comes into contact with the inner pressure face.

26. (New) The fuel injection valve as defined by claim 23, wherein the inner valve needle in its closing motion toward the valve seat moves the opened outer valve needle in the closing direction by means of contact with the shoulder.

27. (New) The fuel injection valve as defined by claim 24, wherein the inner valve needle in its closing motion toward the valve seat moves the opened outer valve needle in the closing direction by means of contact with the shoulder.

28. (New) The fuel injection valve as defined by claim 25, wherein the inner valve needle in its closing motion toward the valve seat moves the opened outer valve needle in the closing direction by means of contact with the shoulder.

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29. (New) The fuel injection valve as defined by claim 24, further comprising an inflow throttle controlling filling of the inflow chamber with fuel under pressure, and wherein the inner valve needle closes the inflow throttle upon contact with the fixed stop.

30. (New) The fuel injection valve as defined by claim 25, further comprising an inflow throttle controlling filling of the inflow chamber with fuel under pressure, and wherein the inner valve needle closes the inflow throttle upon contact with the fixed stop.

31. (New) The fuel injection valve as defined by claim 23, wherein the inner pressure face and the shoulder are embodied conically, and wherein the conical faces have different opening angles, so that the shoulder can come into contact with a sealing edge on the inner pressure face in such a way that the communication of the inflow chamber with the intermediate chamber via the connecting bore is disrupted.

32. (New) The fuel injection valve as defined by claim 19, wherein the valve seat is embodied substantially conically, wherein at least one outer injection opening and one inner injection opening originate at the valve seat, and wherein the outer valve needle controls the outer injection openings, and the inner valve needle controls the inner injection openings.

33. (New) The fuel injection valve as defined by claim 32, wherein the outer valve sealing face on the outer valve needle is shaped such that upon contact of the outer valve needle with the valve seat the outer injection openings are sealed off both upstream and downstream.

34. (New) The fuel injection valve as defined by claim 30, wherein the outer valve sealing face on the outer valve needle comprises an outer sealing edge and an inner sealing edge, of which the outer sealing edge comes into contact with the valve seat upstream of the outer injection openings and the inner sealing edge comes into contact with the valve seat downstream of the outer injection openings whereby the outer injection openings are sealed off in both flow directions.

35. (New) The fuel injection valve as defined by claim 19, further comprising an inflow throttle providing fluid communication between the control chamber and an inflow conduit an outflow conduit providing fluid communication between the control chamber and a fuel tank, and a control valve disposed in the outflow conduit and operable to open or close the outflow conduit.

36. (New) The fuel injection valve as defined by claim 19, wherein the control chamber can be made to communicate with a fuel tank via an outflow conduit, and wherein the outflow conduit the fuel tank and the inflow conduit communicate with a control valve in such a way that the outflow conduit communicates with the fuel tank in a first switching position of the control valve and with the inflow conduit in a second switching position.

37. (New) The fuel injection valve as defined by claim 19, further comprising a first cylindrical extension and a further cylindrical extension embodied on the inner valve needle and axially spaced apart from one another, the first and second cylindrical extensions being

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embodied such that at the cylindrical extensions, a hydraulic sealing is effected at a place between the inner valve needle and the outer valve needle, and by means of the hydraulic extensions a control volume is defined which communicates with the inflow chamber via a throttle bore.

38. (New) The fuel injection valve as defined by claim 37, wherein the control volume and the throttle bore are designed such that the outer valve needle at the maximum injection quantity of the fuel injection valve, does not come into contact with a fixed stop.

39. (New) The fuel injection valve as defined by claim 38, wherein the closing speeds of the outer valve needle and inner valve needle are adapted to one another such that at the maximum injection quantity of the fuel injection valve, upon their closing motion, they come into contact with the valve seat simultaneously.